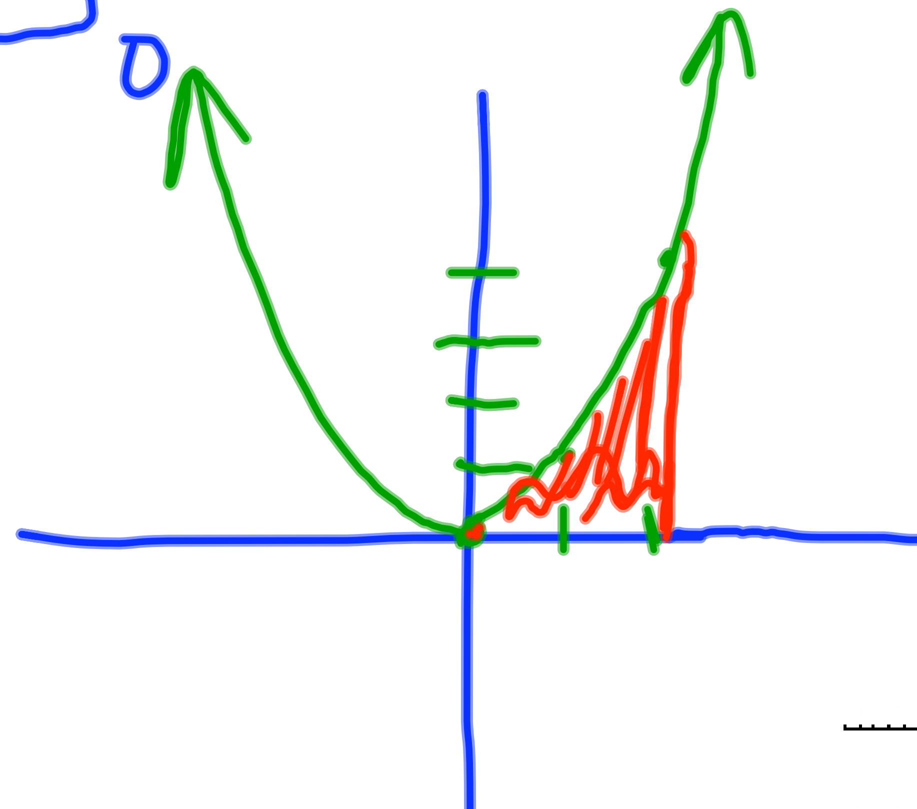
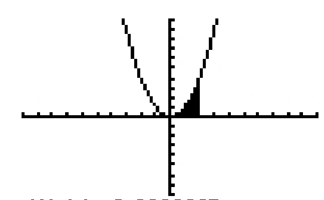
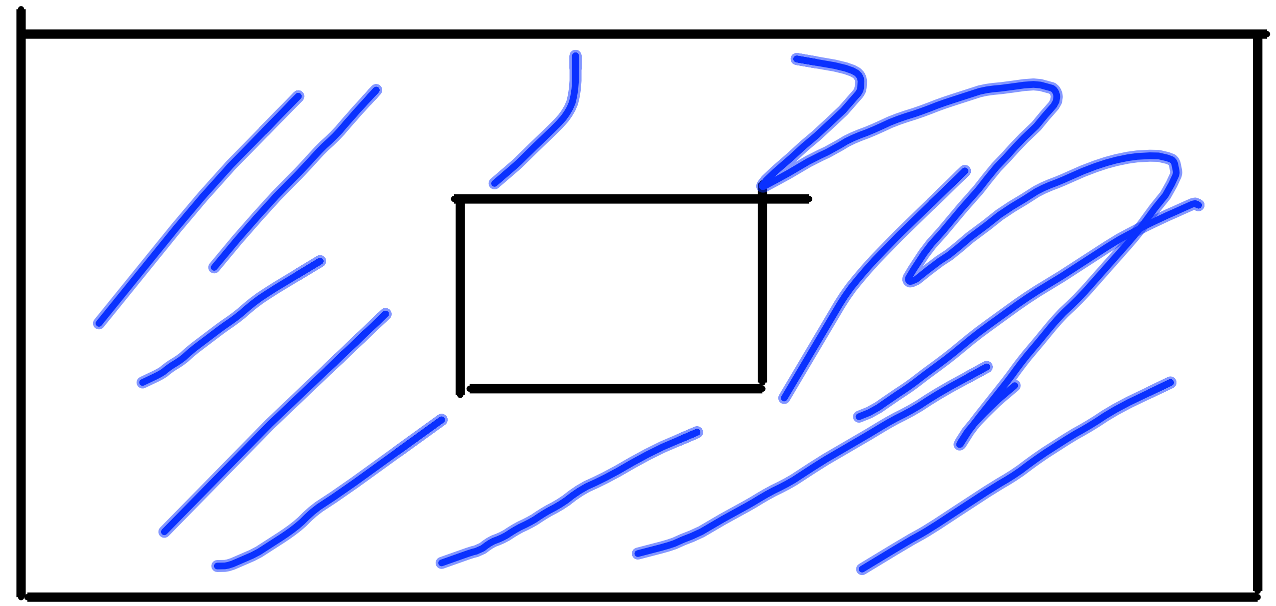
$$\int_0^2 x^2\,dx = \frac{x^3}{3}\Big]_0^2 = \frac{8}{3} - 0 = \frac{8}{3}$$

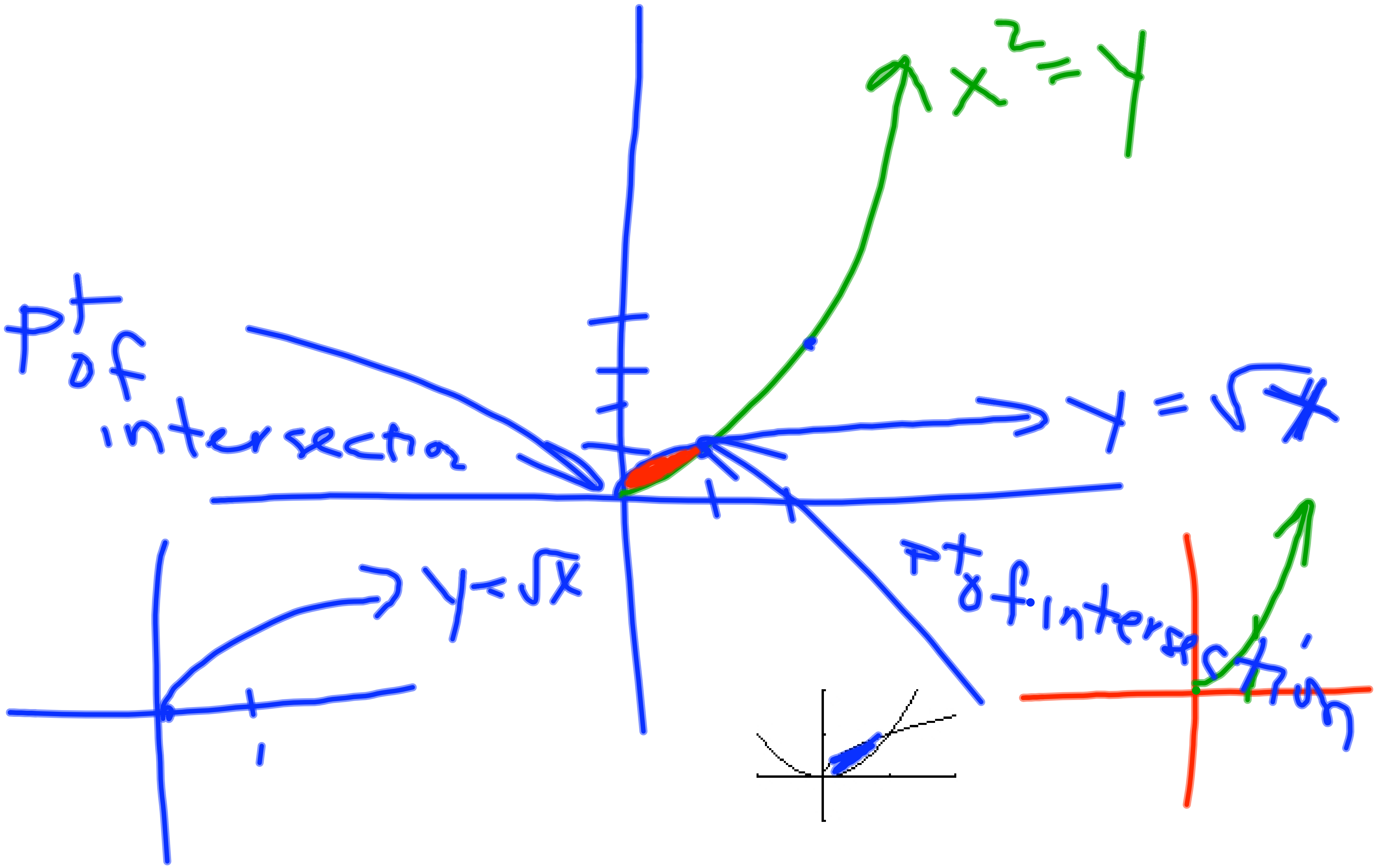
parabola







Area − Area of what's missing
entire thing
= Area of Shaded



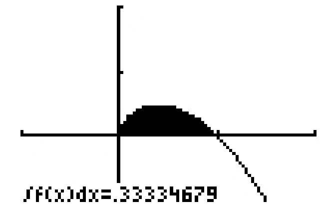
pt of intersection
$x^2 = y$
$y = \sqrt{x}$
$y = \sqrt{x}$
pt of intersection

$$\int_0^1 \sqrt{x}\,dx - \int_0^1 x^2\,dx$$

$$\left.\frac{2}{3}x^{3/2}\right]_0^1 - \left.\frac{x^3}{3}\right]_0^1$$

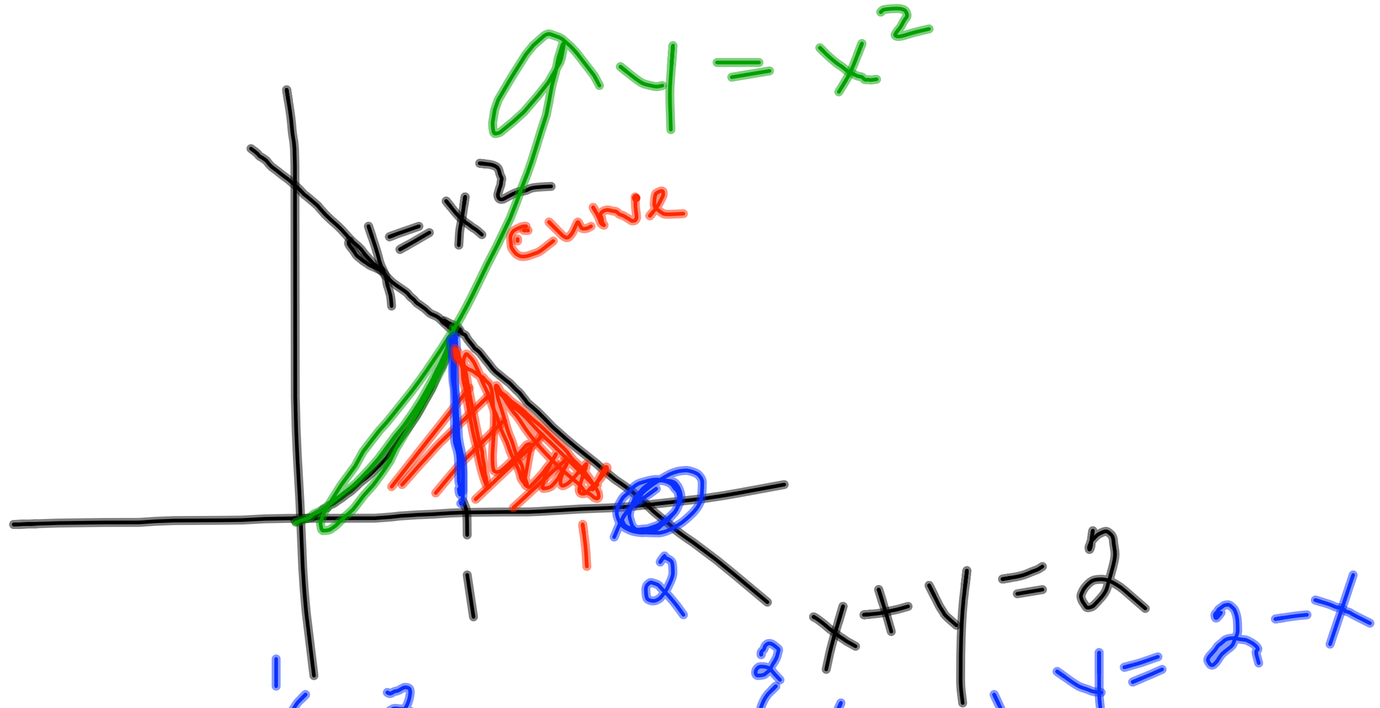
$$2/3 - \frac{1}{3} = \frac{1}{3}$$

$$\int_0^1 \left(\sqrt{x} - x^2\right) dx$$



$$\left.\frac{2}{3}x^{3/2} - \frac{x^3}{3}\right]_0^1 = \left(\frac{2}{3} - \frac{1}{3}\right) - 0$$

$$= \frac{1}{3}$$



$$\int_0^1 x^2\,dx + \int_1^2 (2-x)\,dx$$

$$\frac{x^3}{3}\Big]_0^1 = \frac{1}{3}$$

$$2x - \frac{x^2}{2}\Big]_1^2$$

$$(4-2) - \left(2 - \frac{1}{2}\right)$$

$$\frac{1}{2}$$

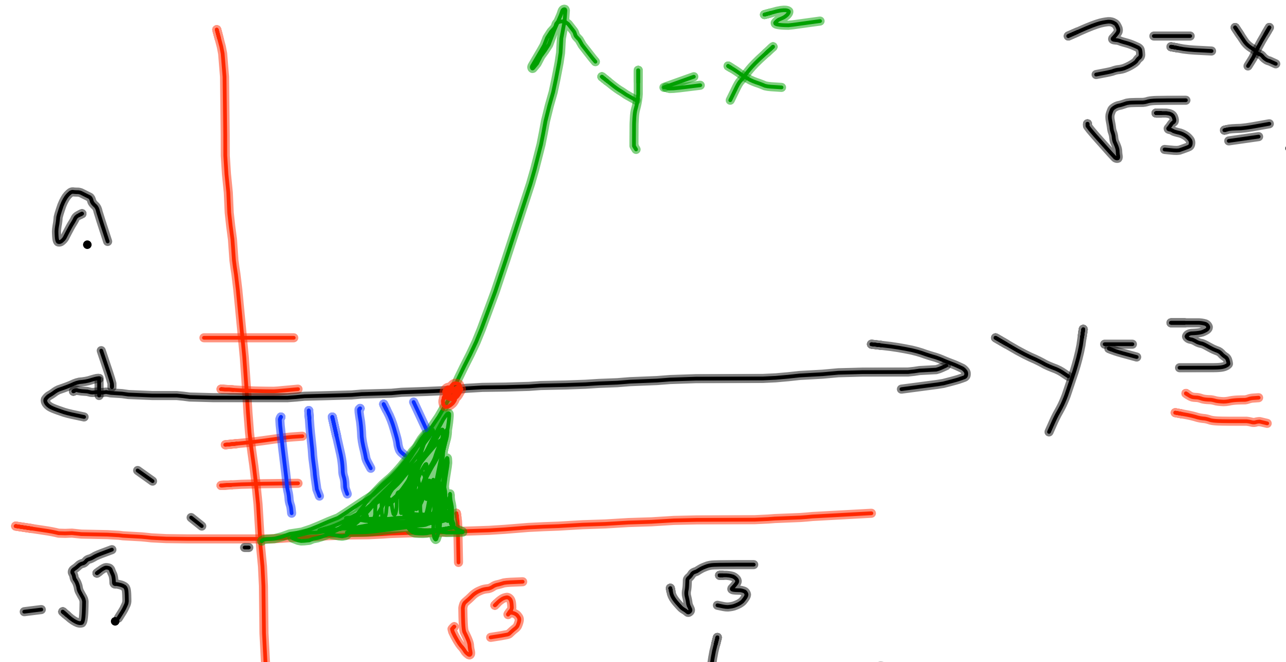
$$A = \frac{1}{3} + \frac{1}{2} = \frac{2}{6} + \frac{3}{6}$$

$$A = \frac{5}{6} \text{ sq. units}$$

$3 = x^2$

$\sqrt{3} = x$

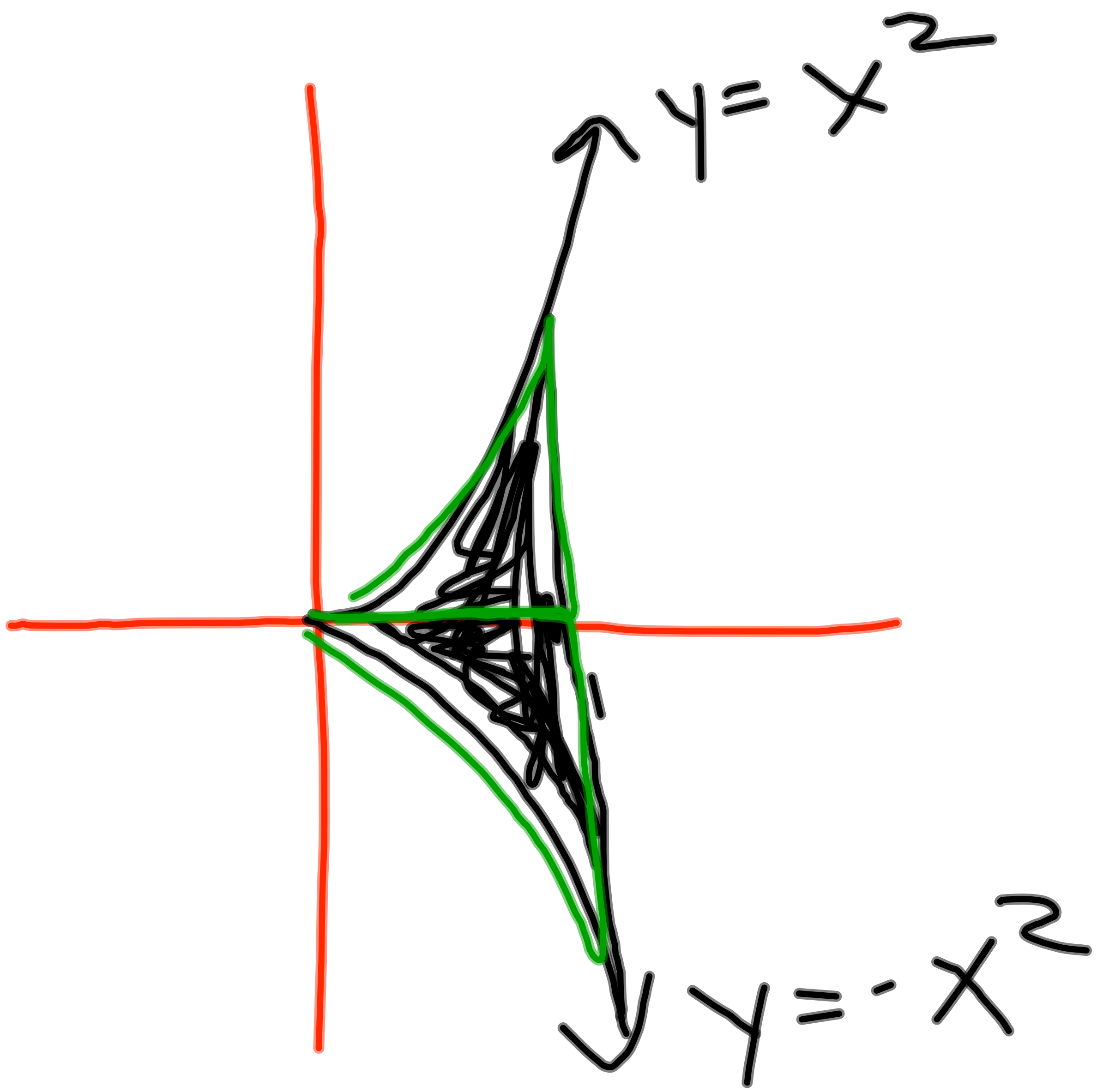
a.



$$3\sqrt{3} - \int_0^{\sqrt{3}} x^2\,dx$$

$$3\sqrt{3} - \frac{x^3}{3}\Big]_0^{\sqrt{3}} = \frac{\cancel{3}\sqrt{3}}{\cancel{3}} = 2\sqrt{3}$$

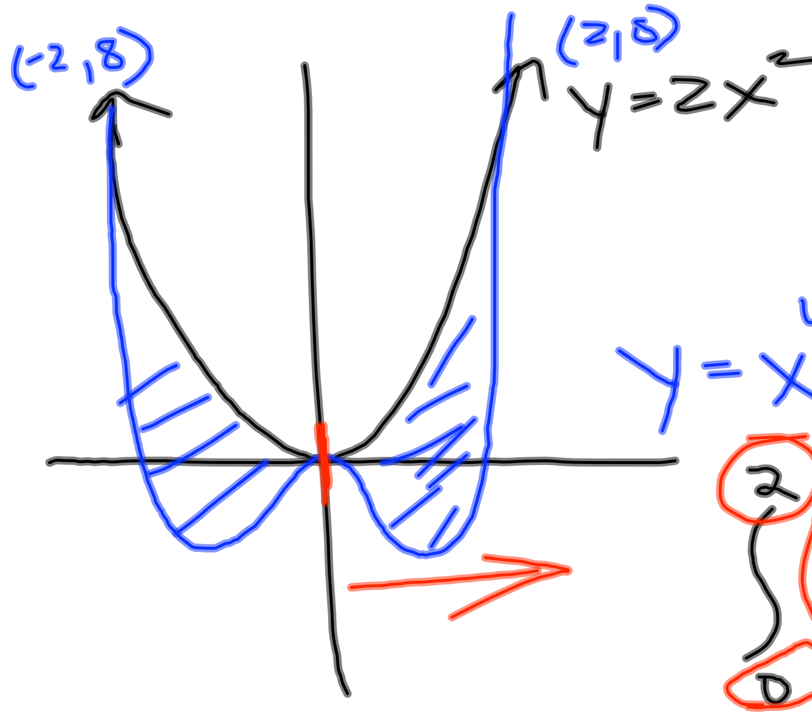
$$\int_0^{\sqrt{3}} 3\,dx = 3x\Big]_0^{\sqrt{3}} = 3\sqrt{3}$$



$$\int_0^1 \underline{x^2} - \underline{(-x^2)}\,dx = \int_0^1 2x^2\,dx$$

$$2\int_0^1 x^2\,dx$$

$$2\frac{x^3}{3}\Bigg]_0^1 = \frac{2}{3}$$



$$\int_0^2 \left[2x^2 - \left(x^4 - 2x^2\right)\right] dx$$

$$\int_0^2 \left(4x^2 - x^4\right) dx$$

$$\left.\frac{4}{3}x^3 - \frac{x^5}{5}\right]_0^2$$

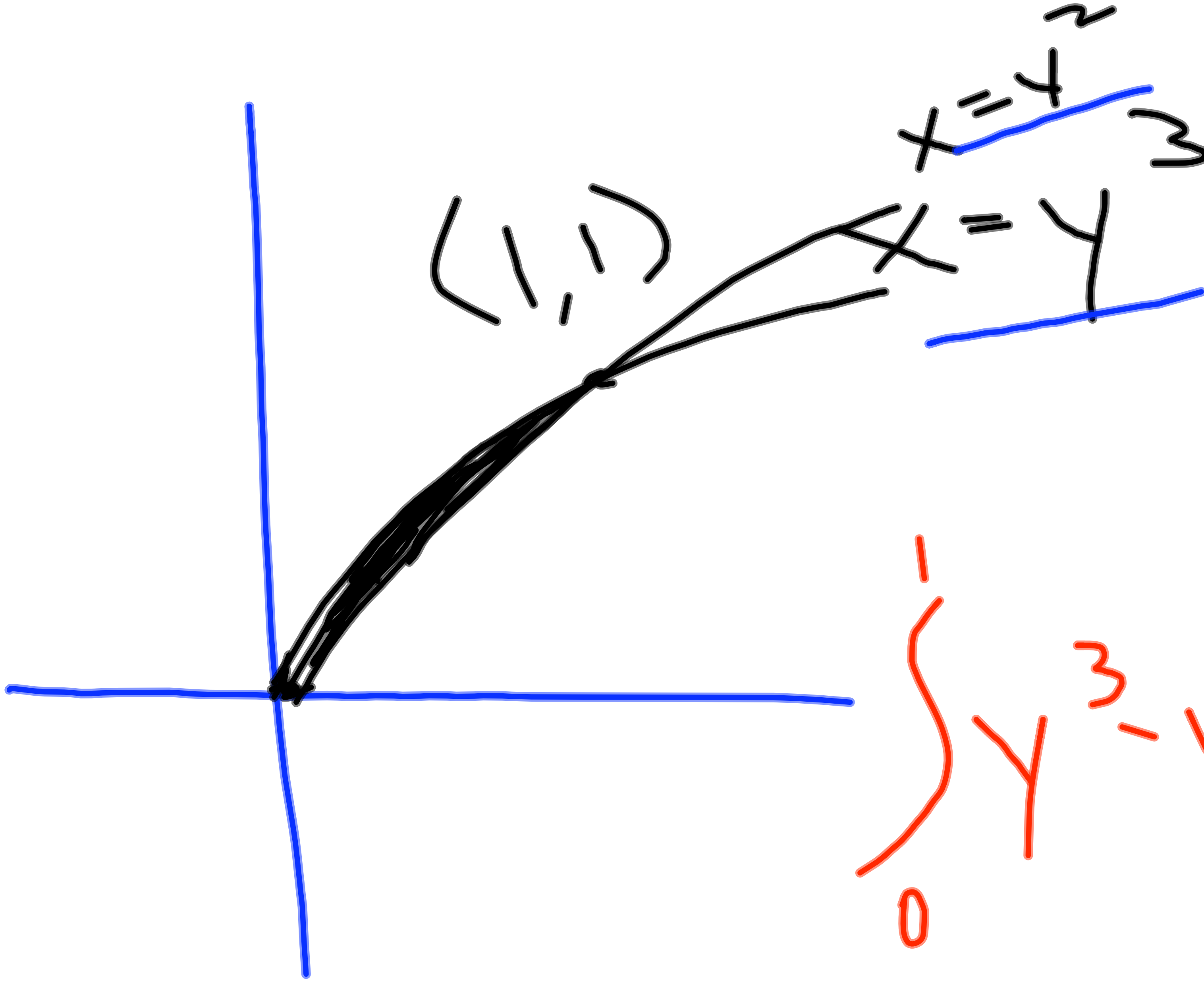
$$\frac{32}{3} - \frac{32}{5}$$

$$\frac{160}{15} - \frac{96}{15} = \frac{64}{15}$$

$$A = 2 \cdot \frac{64}{15} = \frac{128}{15} \text{ sq units}$$

- look for symmetry

- Top "Curve" - Bottom "Curve"
- sometimes add areas
- look for points of intersection



$$\boxed{\begin{aligned} y &= \sqrt{x} \\ y &= \sqrt[3]{x} \end{aligned}}$$

$$\int_0^1 y^3 - y^2 = \frac{y^4}{4} - \frac{y^3}{3}$$

$$= \frac{1}{4} - \frac{1}{3} =$$

HW
p. 380
1-4, 6-13 all